Imported South African Tick Typhus

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INTERNATIONAL TRAVEL is common today. Modern transportation enables persons harboring infections to travel to regions where a particular illness is rare or absent, and physicians are unfamiliar with the disease picture. We report here two cases of San Diego patients who had contracted South African tick typhus.

Reports of Cases

CASE 1. A 47-year-old physician was seen on January 27, 1981, with a self-diagnosis of South African tick typhus. On January 10 the patient, his wife and daughter had returned from a three-week safari in South Africa.

During the stay in Africa, each took chloroquine weekly and doxycycline hyclate, 100 mg, daily. The latter was discontinued two or three days before departure. Much of the time in South Africa was spent in the bush, including walking through tall grasses on a photographic safari in Zululand during the last part of the trip. On the day of his return to the United States, he removed an engorged tick from the tip of his penis. Although he did not recall removing any other ticks during his stay in South Africa, two days later he noted a lesion in the left inguinal region that had the features of a tick bite. On January 16 he noted lymphadenopathy, cough, subjective fever and increasing shortness of breath; he nevertheless was well enough to ski that week with his family. On January 20 he had fever (38° to 39°C [101° to 102°F]) and shaking chills, tachycardia, headache and myalgia. These symptoms persisted and on January 26 he first noted a diffuse maculopapular rash, most striking on the trunk, and diagnosed his illness as South African tick typhus. He then sought medical advice. Treatment with tetracycline, 1 gram a day, was begun. Within 24 hours he was afebrile and symptomatically much improved, though the rash persisted; he now noted arthralgia, particularly in the small joints of the hands.

On physical examination he appeared neither acutely nor chronically ill. He was afebrile and had a blood pressure within the normal range; the pulse rate was 100 beats per minute and regular. Pertinent abnormal physical findings were limited to the skin and lymph nodes. There was a diffuse nonconfluent maculopapular rash most striking over the trunk, but also present on the face, arms and legs (Figure 1). The rash was not petechial and blanched readily on pressure. There was no rash on the palms or soles. A nontender 8-mm black eschar surrounded by a 10- to 12-mm area of erythema and desquamation was present in the left groin (Figure 2). Adenopathy was limited to a single, 1-mm tender inguinal node directly above the eschar.

Laboratory studies disclosed the following values: hemoglobin, 15.9 grams per dl; hematocrit, 46.1 percent; leukocyte count, 4,300 per μl, with 56 percent segmented neutrophils, 14 percent band forms, 25 percent lymphocytes and 4 percent mononuclear cells. The platelet count was normal (262,000 per μl), but fibrinogen levels were elevated (296 mg per dl) and a thrombo-Wilcox test for fibrin-split products was positive (1:5 and 1:20).

The tick was identified by Dr Robert N. Philip at the Rocky Mountain Laboratory in Montana as a larva belonging to the genus *Aponomma,* species undetermined. Serologic tests carried out at the Centers for Disease Control showed a rise in indirect fluorescent antibody titers to *Rickettsia conorii* from 1:16 on January 26 to 1:256 on February 18. Antibody to Rocky Mountain spotted fever antigen also measured by indirect fluorescent antibody test showed a rise in titer from 1:32 to 1:256.

Four days after leaving South Africa, the patient's

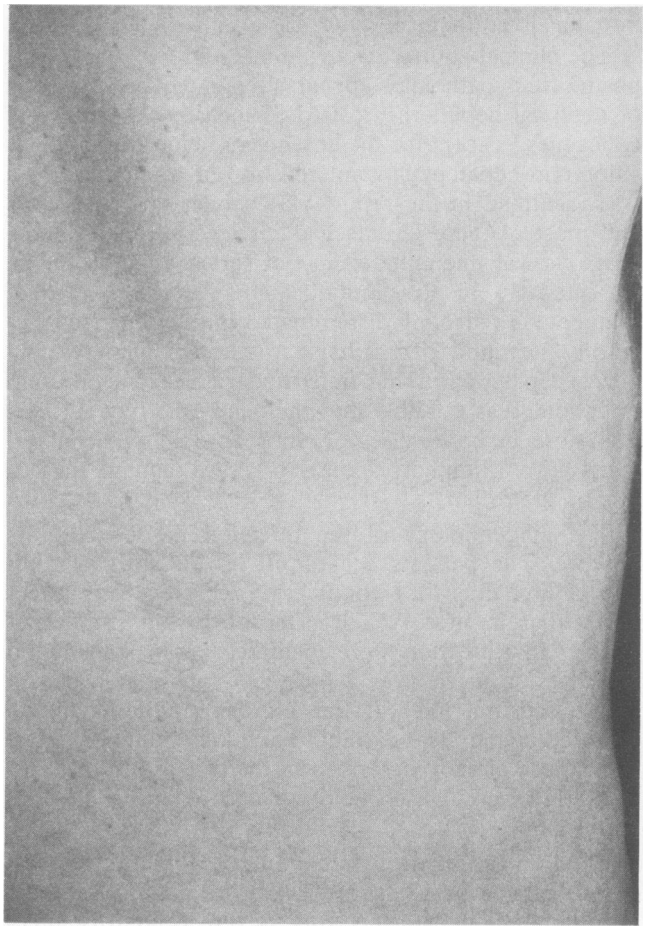

Figure 1.—Rash on the trunk of patient in case 1.

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wife noted upper respiratory symptoms, subjective fever and two eschars similar to the patient's lesion, one on the chest and one on the buttocks (Figure 3). She had no chills or rash. In addition to the 100 mg daily of doxycycline prophylaxis while in Africa, she had taken a cephalosporin by mouth for ten days after returning to the United States "because she thought she was getting a cold." Serologic studies on the patient's wife showed an indirect fluorescent antibody titer of 1:128 on both January 27 and February 18 to *R conorii,* and a titer of 1:128 on January 27 and 1:256 on February 18 to Rocky Mountain spotted fever antigen.

The patient's daughter remained well except for a cold after returning to the United States. She was taking 250 mg of tetracycline daily for acne control, and had taken 100 mg of doxycycline daily as diarrhea prophylaxis in Africa. She was not studied serologically.

CASE 2. A 57-year-old physician traveled through South Africa from July 15 to July 28, 1977. During his stay he made several trips to the bush and was aware of tick bites. On August 10 he noted the onset of severe malaise accompanied by a mild headache, fever and lymphadenopathy. A papular rash was observed on one hand and one leg distal to bite sites. The rash became vesicular and ultimately crusted. A clinical diagnosis of tick typhus was made, he was treated with tetracycline and recovery was uneventful. Indirect fluorescent tests for antibody to Rocky Mountain spotted fever antigen, carried out in the California State Health Services Laboratory, showed a rise in titer from less than 1:8 on August 4 to 1:1,024 on August 18. Serologic tests for *R conorii* were unavailable in 1977.

Discussion

Boutonneuse fever, a tick-borne typhus with *R conorii* as its agent, occurs throughout the African continent, in European and Middle Eastern areas adjacent to the Mediterranean, Black and Caspian Seas, and in India. It is a potentially important disease of travelers because attractive places and infected Ixodidae tick vectors are both found in these areas. Boutonneuse fever in tourists has been reported in the Netherlands, Germany and Switzerland.[1] These two cases serve as a reminder that the disease is also occasionally imported into the United States.

African tick typhus is a mild to moderately severe illness with a usual incubation period of five to seven days. In a typical case, a patient has fever for several days to two weeks, an initial lesion called a tache noire and a generalized maculopapular erythematous rash that appears on about the fifth day and often involves the palms and soles.[2] The tache noire at the site of tick attachment typically is seen on parts of the body

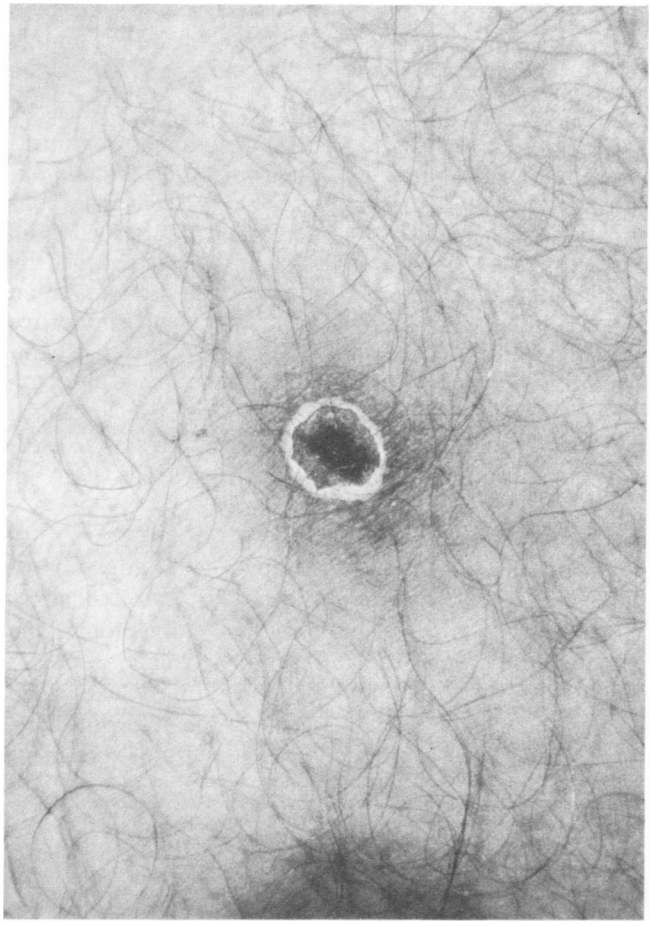

Figure 2.—Eschar on groin of patient in case 1.

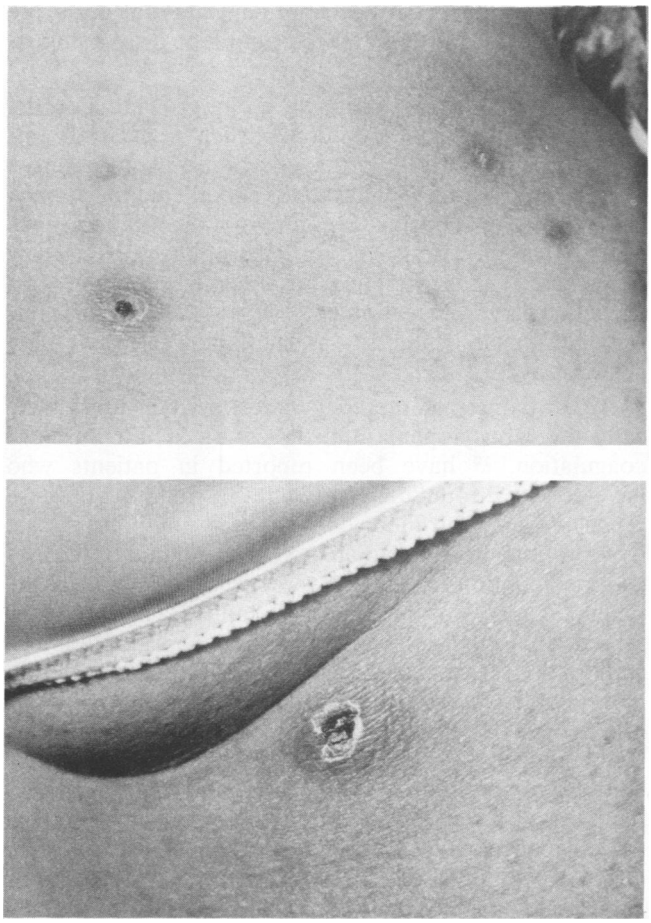

Figure 3.—(top and bottom) Eschars on trunk of wife of patient in case 1.

covered by clothing, resembles a cigarette burn and is often accompanied by regional lymphadenitis. Malaise, headache and tachycardia are characteristic but nonspecific findings. Patients usually become afebrile within two to three days of taking tetracycline. Death is rare. Diagnosis is confirmed by seroconversion to *R conorii* antigen, or—with compatible exposure history and clinical manifestations—to the closely related antigen of Rocky Mountain spotted fever.

The first patient and his family are of additional interest in view of the antibiotic history and its apparent effect on the course of infection. The patient, his wife and daughter all took a tetracycline with sustained blood concentrations until two to three days before leaving Africa. This may have been responsible for the delayed onset of illness in the first patient and could have suppressed the infection in his wife, who had two eschars but no rash or seroconversion. It is also possible that infection in the daughter was prevented by her continuous use of low-dose tetracycline for control of acne. Others have shown that a single dose of doxycycline cures epidemic typhus *(Rickettsia prowazekii)*[3,4] and that a weekly 200-mg dose continued for six weeks after exposure prevents scrub typhus *(Rickettsia tsutsugamushi)*.[5] Chemoprophylaxis of tick typhus has not been studied in man, but studies of guinea pigs infected with *Rickettsia rickettsii* suggest that the efficacy of a single dose of oxytetracycline depends on both the inoculum of rickettsiae and the timing of drug administration.[6]

Tetracylines stop rickettsiae from growing but the final eradication probably depends on a patient's immune responses. Early in the infection, rickettsiae grow equally well in macrophages and endothelial cells; antibody-coated rickettsiae can grow in endothelial cells but are rapidly destroyed in macrophages. Recovery from tick typhus therefore depends on the diversion of rickettsiae from endothelial cells—where they multiply and cause vasculitis—to macrophages, where they are destroyed.

Abnormalities of the coagulation system, most typically thrombocytopenia and disseminated intravascular coagulation,[7-12] have been reported in patients who have Rocky Mountain spotted fever. In the first case reported here, thrombocytopenia was not present, but hyperfibrinogenemia and an increased amount of fibrinogen degradation products were present. Because the platelet count was normal it is unlikely that the observed abnormalities were due to a consumption coagulopathy. It is more probable that the coagulation abnormalities were a consequence of vasculitis and the release of thromboplastic and fibrinolitic substances from damaged vessels. Studies of the coagulation and complement systems in rhesus monkeys with experimentally induced Rocky Mountain spotted fever also suggest that the hemostatic disturbances are a direct effect of the infectious vasculitis.[13]

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Antimuscle Antibody in Infantile Botulism

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INFANTILE BOTULISM, a disease resulting from intraintestinal toxin production by *Clostridium botulinum*, generally affects young infants. They present with constipation, slow feeding, hypotonia and diminished deep tendon reflexes.[1] A definitive diagnosis is established by the finding of *C botulinum* or its toxin in the feces of an affected infant. The disorder is treated with supportive measures, antitoxin having little or no clinical benefit, and survivors recover completely in one to six months.[2] We describe here a case of infantile botulism in which unusually prolonged duration of symptoms was associated with antiskeletal muscle antibody.

Report of a Case

A 4-month-old infant was brought to Childıens Hospital of Los Angeles with a five-day history of constipation, weak cry, fever and progressive hypotonia. On examination there were diffuse rales; bilateral ptosis; diminished suck, gag and deep tendon reflexes, and greatly diminished skeletal muscle tone. *C botulinum*, type A, and toxin were identified from stool specimens

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